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## CONSEQUENCES OF COVID-19 AND WARS IN UKRAINE ON CHANGES IN THE ACTIVITIES OF AIR CARRIERS

*The article is devoted consequences of the pandemic COVID-19 and the War in Ukraine on air transport activities of world. The introduction of quarantine had significant negative consequences for the activities of transport market operators in world. The creation of serious restrictive measures included the complete cessation of passenger transportation by any transport, total ban on international flights has forced airlines to suspend operations. This situation has led to the cessation of travel planning by customers and the decline in operating performance of domestic transport operators (especially airlines) by almost 100%.*

*The Russian invasion of Ukraine and the effects of the deployment of the humanitarian crisis have stunned the world. This situation has affected aviation in many ways. In these extraordinary times, aviation companies are focused on refunds for canceled or changed travel plans. But the Federal Aviation Administration's prohibition on flying over Ukraine, Belarus and much of Russia requires some routes to make costly diversions. According to the changing situation, operators are forced to make adjustments to long routes, so an increase in the time and distance of flight, along with increasing fuel prices, which as a consequence, will have an impact on the aviation industry around the world. The countries European Union and US announced a restriction on all Russian flights. Owing to these restrictions, several passenger and cargo flights are being cancelled or rerouted, in addition, they suspended maintenance support to the Russian fleet.*

*The continuation of hostilities influenced the emergence in the airspace of Ukraine several reconnaissance aircraft, including Blackhawk helicopters, unmanned aerial vehicles, filling aircraft and large transport, air patrol fighters of NATO member states. The increase in oil prices affects all tickets, even on internal routes.*

**Key words:** air transportation, routes, COVID-19, war, airline, carrier.

**Formulation of the problem.** Ukraine has a favorable geographical location, which creates favorable conditions for participation in world shipping, development of international trade relations. Ukraine ranks first in Europe by transit (the transit coefficient of Ukraine – 3.75, Poland, which occupies the second place – 2.92).

The global situation related to the COVID-19 and especially, the Russian invasion of Ukraine contributed to the emergence of restrictions imposed by countries directly influenced the world aviation industry. The ban of Federal Aviation administration on the flights over Ukraine, Belarus and better part of Russia requires the change of routes.

**Analysis of recent research and publications.** The European Union Aviation Safety Agency (EASA) and European Centre for Disease Prevention and Control (ECDC) at May 11, 2022 issued an update to the health safety measures for air travel, dropping the recommendation for mandatory wearing of medical masks in airports and on board a flight, while noting that a face mask is still one of the best protections against the transmission of COVID-19 [1].

Even more stringent measures were embodied as a result of the Russian invasion of Ukraine. The ban

on the Federal Aviation Administration [3] for flights over Ukraine, Belarus and for the most part of Russia requires changes in routes.

Even as operators are making constant adjustments to the rapidly changing situation, longer routes, increasing oil prices and increased flying time are expected to have an impact on the airline industry worldwide [4]. Aviation experts believe that the global aviation industry, which is barely recovering from the COVID-19 pandemic, will have an uphill task in dealing with the direct and indirect consequences of the Russian invasion of Ukraine, although its full impact is still not known [5].

**Formulation of article goals.** The main goal is to assess the influence of the pandemic of coronavirus and Russian invasion of Ukraine on the transport activities of world aviation.

**Presenting main material.** The update of the joint Aviation Health Safety Protocol takes account of the latest developments in the pandemic, in particular the levels of vaccination and naturally acquired immunity, and the accompanying lifting of restrictions in a growing number of European countries [1]. These recommendations include changes to masks, the relief of more stringent measures in air operations, which

will help improve the situation in the industry, while maintaining the appropriate measures. Vulnerable passengers should continue to wear a face mask regardless of the rules, ideally an FFP2/N95/KN95 type mask which has a higher level of protection than a standard surgical mask. Passengers, Airport staff and crew members should be alert and follow the recommendations and requirements of the national authorities of the region they are visiting.

Domestic recovery varies dependent on virus control COVID-19 variants are new source of uncertainty. Route planning – impact of Covid variants shows on the figure 1. Analyze searches worldwide for 'COVID-19', 'COVID variants' and 'Skyscanner' [6].

The Russian invasion of Ukraine and the effects of the deployment of the humanitarian crisis have stunned the world. This situation has affected aviation in many ways. First, it is helpful to understand pre-war Ukrainian and Russian traffic.

The Ukrainian airspace is closed, which is approximately 0.8% of the total movements by air around the world in accordance with 2021, and up to 3.3% of the total air passenger traffic in Europe.

Moldova has fully closed his airspace, while Belarus has prohibited flights over parts of his territory. These countries make up a small part of the regional and global air passenger traffic.

Russian domestic traffic accounts for 4.5% of global RPKs (revenue passenger kilometers) International air passengers between Russia and Europe accounted for 5.7% of total European traffic in 2021. Even though a relatively small portion of global traffic directly involved Russia or Ukraine, the war and associated sanctions have global implications for airlines and the work of IATA.

The European Union and US countries announced a restriction on all Russian flights, including own airspace for Russian aircraft. Russia responded to restrictions on the same, banning the flight over Russia. Earlier, the Rosaviatsiya – Aviation Agency recommended all Russian airlines with rented foreign-leased planes stop flights abroad. The consequences of this situation in the United States were canceled or redirected several passenger and cargo flights. The American company Boeing and European aviation conglomerate Airbus has already announced the suspension of support for maintenance of the Russian fleet. It is known that Aeroflot has a mixed fleet of Boeing and Airbus aircraft. The results of the analysis of carriers are affected by world sanctions and Covid are in Table 1.

The outbreak of war has meant the complete closure of air travel to/from/within Ukraine. And connectivity between Russia and the rest of the world has been dramatically reduced through airspace closures. This has presented a challenge to IATA's settlement systems, which process transactions between airlines and travel agents.

The IATA settlement systems normally facilitate the transfer of funds from ticket sales to airlines, but in these extraordinary times the focus is on processing refunds for cancelled or altered travel plans. This affects the customers of some 140 airlines participating in IATA's Russian BSP (Billing and Settlement Plan) as well as thousands of travel agents worldwide. Processing these refunds has been even more challenging due to sanctions.

IATA's settlement systems have also seen shifts in demand characteristics for countries neighboring Ukraine. While there has been a drop for inbound demand, there has been an uptick in bookings for

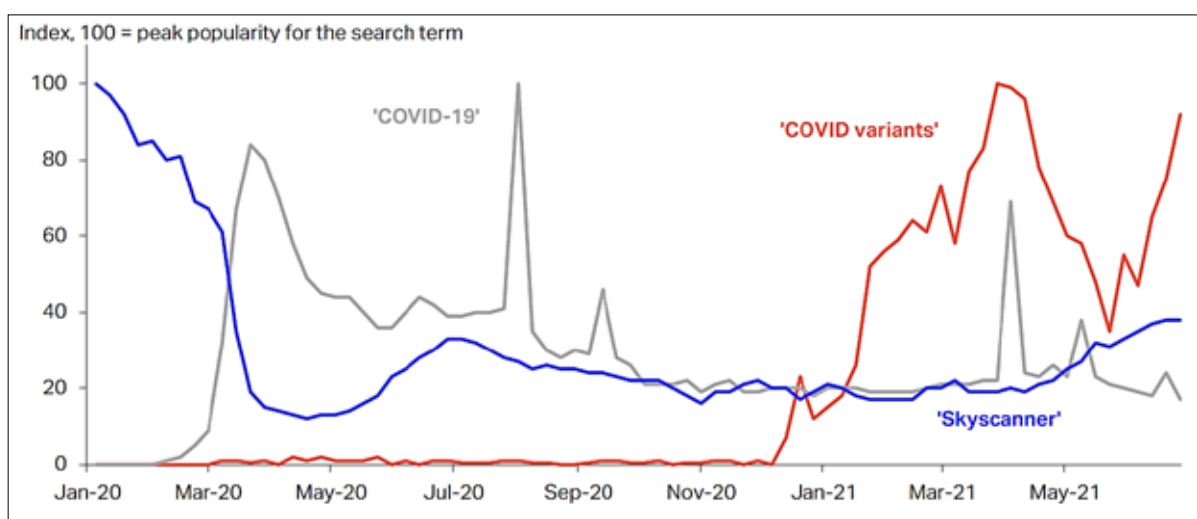


Fig. 1. Analyze searches worldwide for 'COVID-19', 'COVID variants' and 'Skyscanner'

Analysis of carriers are affected by world sanctions and Covid

Notable carriers impacted by Covid	Notable carriers impacted by Global sanctions
FlyBE (ceased operations in March 20) UK	Volgr-Depnr (Sanctioned in March 22) Russia
Virgin Australia (April 20) Australia	Aeroflot (Sanctioned in March 22) Russia
Alitalia (October 21) Italy	Rossiya Airlines (Sanctioned in March 22) Russia
Air Italy (April 20) Italy	S7 Airline (Sanctioned in March 22) Russia
Germanwings (April 20) Germany	Pobeda (Sanctioned in March 22) Russia
Compass Airline (April 20) USA	Ural Airlines (Sanctioned in March 22) Russia
TAME Ecuador (May 20) Ecuador	Utair (Sanctioned in March 22) Russia
LATAM Argentina (June 20) Argentina	
LEVEL Airlines (June 20) Spain	
AirAsia Japan (October 20) Japan	
Montenegro Airlines (December 20)	



Fig. 2. Analysis of in-and outbound travel in Ukraine’s neighbors

outbound flights as refugees move by air to locations farther afield. In the first weeks of the Russian’s invasion of Ukraine, airlines increased capacity out of these three countries by increasing frequencies larger aircraft onto these routes, fig. 2 [7]. Atlas Obscura said Romania, which borders Ukraine, was among the top-selling trips in the May.

IATA is working closely with authorities and airlines to share information so the changing routings can be well-coordinated. With current low levels of traffic that will need careful management as more of Asia re-opens to travel and volumes pick-up.

Finally, the war caused an increase in oil prices. As fuel is an airline’s largest variable cost, the absorbing such a massive price hike just as the industry is struggling to emerge from the two-year COVID-19 crisis is a huge challenge. If the oil price stays that high, then over time, it is reasonable to expect that it will be reflected in airline yields. Result of increase in oil prices shows in the Table 2.

The negative consequences of the war are obviously major within the EU itself, since we are had economic ties with both Ukraine and Russia. It also brings with it in the EU a flow of refugees. The shock waves are reaching more and more countries and sectors.

Table 2

Oil and fuel price

US\$/barrel (period ave.)	2021	Dec-21	Jan-22	Feb-22	Mar-22
Crude oil (Brent)	70.9	74.7	85.6	94.3	96.186
Jet fuel	77.7	87.1	100.9	110.0	112.2

After introducing restrictions and bans, American airlines, such as UA, for complete their flights between New Deli and Chicago, accepted another route through Western Europe had to avoid using a regular route through Russia.

As there are no direct restrictions between India and Russia the Air India flights between New Deli and

Table 3

## Europe Top 5 carriers by flights

Rank	Airline Group	Flights on 22 May 2022	Flights on 26th May 2019
1	FR Group	2,909	2,522
2	easyJet Group	1,658	1,857
3	Turkish Airlines	1,382	1,341
4	Lufthansa Airlines	1,273	1,515
5	Air France Group	1,028	1,172
<b>Top 5 total flights</b>		<b>8,250</b>	<b>8,407</b>
<b>% of total EuroC flights</b>		<b>30 %</b>	<b>27 %</b>

Chicago airports continue to operate through Russian airspace. This is one of the several instances, even in regions far away from the war, of how the Russian invasion of Ukraine is going to affect the aviation transportations. The Indian government to evacuate thousands of Indian citizens from Ukraine through neighboring countries has deployed multiple passengers as well as Air Force transport, jets such as C-17.

For evacuate citizens who have been crossing the borders from Ukraine have been directed numerous special flights are being operated by many countries to Poland and Romania.

Most passenger flights between Europe and Eastern or Southeastern Asia overfly Russia as a simple function of geography. London to Tokyo, for example, is around an 11- to 12-hour flight, usually overflying Russia and the Nordic countries.

The first option for airlines avoiding Russia is flying south, skirting the Black Sea and the Caucasus before flying over central Asia. This would be a slightly modified, post-Soviet version of the London-India-Hong Kong routes flown during the Cold War. The second option is to fly north, over Greenland and far northern Canada to Alaska and the Bering Strait, avoiding eastern Russia.

While operators continue to make adjustments according to the changing situation, increased flying time, longer routes along with rising fuel prices are expected to have an impact on the aviation industry worldwide. The Number of Flights on May 22, 2022 on Airline Group is shown in table 3.

At this time, travel companies do not see mass cancellations flights as travelers, since travelers adhere to their resolve in the realization of own plans when fulfilling the recommendation from the pandemic. Nearly 65 percent of American adults surveyed by TheVacationer.com, a travel strategy website, said

they would accept higher prices, longer transit times or another deterrent in order to travel in 2022.

Data of monitoring of Flightradar24 was paid attention on some interesting changes in the airspace of the NATO member countries that bordering Ukraine. Can be seen several flights operating in a recurring flight pattern, near to the western borders of Ukraine. The cause of the situation is air patrols near Ukrainian borders, another reason for such models may be a growing number of aircraft at the airports of neighboring countries.

On the open-source flight tracking platform for the past few days have been seen over several reconnaissance aircraft, Blackhawk helicopters, Unmanned Aerial Vehicles, large transport and refuelling aircraft including fighter jets.

Most aviation experts believe that the global aviation industry is restored after the COVID-19 pandemic by the implementation of quarantine measures, and the consequences of the Russian invasion of Ukraine are completely unknown, although this already affects on the price of a passenger and freight transportation and accordingly on the price of the goods.

**Conclusions.** According to the study, the influence of the COVID-19 pandemic had significant negative consequences for the activities of the transport market operators in the world. The realization of quarantine measures made it possible to get out of the crisis by aviation companies. Due to the Russian invasion of Ukraine ban for flights were implemented over Ukraine, Belarus and Russia, to receive sides of the airlines of Russia, as well as refusal to support maintenance to the Russian fleet. The consequences of this ban is a change in the routes of aircraft, as a result, an increase in the range and flight time, increasing the cost of flights. In addition, there were refunds of money due to the cancellation or altered plans to travel citizens of different countries.

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### **Мєдведєва Н.А. НАСЛІДКИ COVID-19 ТА ВІЙНИ В УКРАЇНІ НА ЗМІНИ У ДІЯЛЬНОСТІ ПОВІТРЯНИХ ПЕРЕВІЗНИКІВ**

*Стаття присвячена наслідкам пандемії COVID-19 та війни в Україні на повітряний транспорт світу. Впровадження карантину мало значні негативні наслідки для діяльності операторів транспортного ринку у світі. Створення серйозних обмежувальних заходів включало повне припинення пасажирського транспорту будь-яким транспортом, загальна заборона на міжнародні рейси змусила авіакомпанії призупинити операції. Ця ситуація призвела до припинення планування подорожей з боку клієнтів та зниження операційних показників домашніх транспортних операторів (особливо авіакомпаній).*

*Російське вторгнення в Україну і, як наслідок, розгортаюча гуманітарна криза приголомшили світ. Війна в Україні вплинула на авіацію у багатьох відношеннях. У ці надзвичайні часи зосереджено на обробці коштів для скасування або змінених планів подорожей. Заборона Федеральної авіаційної адміністрації на польоти над Україною, Білоруссю та здебільшого Росії потребує деяких маршрутів, щоб зробити відгалуження. У той час як оператори продовжують вносити корективи відповідно до ситуації, що змінюється, більш довгими маршрутами, збільшення часу польоту поряд із зростанням цін на паливо вплине на авіаційну галузь у всьому світі. Країни Європейського Союзу та США оголосили про обмеження на всі російські рейси. Через ці обмеження кілька пасажирських та вантажних рейсів скасовуються або перенаправляються, крім того призупинили у підтримці технічного обслуговування російському флоту.*

*Продовження військових дій вплинуло на появу у повітряному просторі країн-членів НАТО, що межують з Україною, декілька розвідувальних літаків, вертольотів Blackhawk, безпілотних літальних апаратів, великих транспортних та заправних літаків, а також винищувачів для повітряного патрулювання. Підвищення ціни на нафту впливає на всі ціни на авіаквитки, навіть на внутрішніх маршрутах.*

**Ключові слова:** повітряний транспорт, маршрути, COVID-19, війна, авіакомпанія, перевізник.